

Preliminary Note on Hermaphroditism and Embryonic Stages in *Diplodon variabilis*

BY

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(2 Plates)

HERMAPHRODITISM is apparently an unusual phenomenon in mutelid mollusks. However, most of the observations of hermaphroditism were made by punctation of the gonad. If the studies had been made by means of histological serial sections, the phenomenon would probably have been observed more frequently. The present paper deals with one case of hermaphroditism, where some other interesting features were found. The specimen was a *Diplodon variabilis* collected in Miguelin Rivulet, Punta Lara, Argentina during the summer. The shell of the animal measured 27 mm in length and 20 mm in height. The macroscopic study revealed a peculiar aspect of the gills, where numerous protuberances made us suspect the presence of parasites. The specimen was fixed *in toto* in Bouin's fixative and embedded in paraffin. Sections of 6μ were taken every 200μ and stained according to the Heidenhain-Azan trichrome method.

Microscope observations showed a marked male gonadal predominance, with only few female germinal elements.

The presence of numerous completely formed glochidia as well as a tumoral mass were evident in the internal gills.

Microscopic study of the male gonad revealed its normal topographic localization, over the foot of the animal. All stages of spermatogenesis were seen in the gonad.

The female elements of the gonad appeared in an abnormal position as they were formed dorsally with respect to the hepatopancreas and ventrally from the stomach (Figure 1). Compared with a normal female specimen of the same season, the oocytes (Figure 2) were not numerous and presented a reduced size; scant amount of vitellum was seen in the cytoplasm. In the same place, some oocytes undergoing segmentation were found sur-

rounding a small group of male cells, included in the stroma of the ovary (Figure 3). This finding represents an autofecundation phenomenon, which has not been reported previously.

Observations made on the left gill deserve special consideration since glochidia in complete organogenesis were found there. In studies made on this species, glochidia have been mentioned by CASTELLANOS (1965). These observations do not show any important morphological or histological features.

The glochidia appeared inserted in the water tubes of the gills and showed their normal components: the shell rudiment, the mantle, the foot, the gills, and the digestive system (Figure 4). The section of the stomach shows the crystalline style. The typical epithelium, consisting of cells with long cilia, is evident in the intestinal wall.

The section of the hepatopancreas could also be seen (Figure 4).

All these morphological features make the glochidium a perfect replica of the adult animal, except for the gonadal elements. We assume that in this species the development of the larval stage is direct, without an intermediate host.

The tumoral formation located in the gill (Figure 5) may be a teratoma which leads to the assumption of a larval histolysis, perhaps due to an autodigestion of the normal tissues.

The tumoral mass is composed of several vesicles: a large dorsal one; two medial vesicles, one of them in the central cavity, and the other, small one situated laterally. Another vesicle appeared in the ventral zone (Figure 5).

The dorsal formation presents a ciliated epithelium which covers a mass composed of glandular elements, connective tissue, and scarce muscle cells (Figure 6).

Further studies may permit clarification of the fact that so many interesting features can appear together in the

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same specimen. The lack of references in this respect prevent us from making further conclusions.

ACKNOWLEDGMENTS

I would like to thank Prof. Dr. Herberito Prieto Díaz, Prof. Dr. César L. A. Gómez Dumm and Prof. Julián M. Echavé-Llanos, and the members of the technical staff of our Laboratory.

Literature Cited

- CASTELLANOS, ZULMA A. DE
1965. Contribucion al estudio biológico de almejas nacaríferas del Río de La Plata. Rev. Mus. La Plata 8 (60): 99 - 147

Explanation of Figures 1 to 3

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| Figure 1: Internal gill (left side). Oocytes (arrow) | × 50 | Figure 3: Female gonad showing several oocytes. Some of them (arrow) are undergoing segmentation. S - spermatozoa | × 120 |
| Figure 2: Normal oocytes | × 120 | | |

Explanation of Figures 4 to 6

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| Figure 4: Glochidium | × 65 | Figure 5: Tumoral formation located in the internal gill with its vesicles | × 50 |
| F - foot; M - mantle; G - gills; Sh - shell; I - intestine; | | Figure 6: Detail of the dorsal vesicle | × 300 |
| St - crystalline style; H - hepatopancreas | | | |